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EXAMINER				
MEW, KEVIN D				
ART UNIT		PAPER NUMBER		
2416				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/563,085

**Applicant(s)**

PALIN, ARTO

**Examiner**

Kevin Mew

**Art Unit**

2416

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 December 2005.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 24 is/are allowed.  
6) ☒ Claim(s) 1-3, 7-23 is/are rejected.  
7) ☒ Claim(s) 4-6 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 12/30/2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/S5108)  
Paper No(s)/Mail Date 12/30/05  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

***Detailed Action***

***Drawings***

1. The drawings are objected to because Figs. 1-3, 5-7, 9-11 lack descriptive labels. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o).

In claim 18, it recites “a computer readable medium comprising program code,” where the specification fails to provide proper antecedent basis.

In claim 19, it recites “carrier medium carrying the computer executable program,” where the specification fails to provide proper antecedent basis.

Appropriate correction is required:

### ***Claim Objections***

3. Claims 10, 17-18 are objected to because of the following informalities:

In line 11, claim 10, replace the word “initialising” with “initializing.”

Claim 17, which depends from parent claim 16 and then from claim 1, recites “a computer program as claimed in 16 embodied on a computer readable medium.”

Claim 18, which depend from claim, recites “a computer readable medium comprising program code adapted to carry out the method of claim 1 when run on a computer.”

Since both claims 17 and 18 are directed to the same claimed limitations and are therefore repeating claims. It is suggested to the applicant that only one of the claims 17 and 18 be selected as the claimed subject matter.

Appropriate corrections are required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 15 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for “a microprocessor means, a memory means, and a software means for

carrying out the operations of OFDM signal receiver,” does not reasonably provide enablement for “data processing system comprising means for carrying out the method of claim 1.” The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with the claim. Claim 15 is a single means claim, which is a means recitation that does not appear in combination with another recited element of means. Thus, claim 15 covers every conceivable means for achieving the stated purpose, which is held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.

*Claim Rejections - 35 USC § 101*

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 16-17, 19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 16 recites “a computer program comprising computer program code means adapted to perform the method of claim 1 when said program is run on a computer,” and claim 17, recites “a computer program as claimed in claim 16 embodied on a computer readable medium,” which are a nonstatutory descriptive material per se. Computer programs are computer listings per se, i.e., the descriptions or expressions of the programs, which are not physical things. A computer program is merely a set of instructions capable of being executed by a computer, the computer program itself is not a process. Thus, computer programs are neither computer components nor statutory processes, as they are not acts being performed.

Such claimed computer program does not define any structural and functional interrelationships between the computer program and other elements of a computer which permit the computer program's functionality to be realized.

In contrast, a claimed computer-readable medium encoded with a data structure or computer program defines structural and functional interrelationships between the computer program and the computer software and hardware components which permit the computer program's functionality to be realized, and is thus statutory.

Claim 19 recites "a carrier medium carrying the computer executable program of claim 16," which is also a nonstatutory descriptive material per se because it does not fall within the statutory categories (i.e. process, machine, manufacture, or composition of matter). "A carrier medium" per se is not a process, machine, manufacture, or composition of matter. Thus, such a carrier medium cannot be patentable subject matter.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3, 7-12, 14-15, 20-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Foxcroft (WO 01/69878 A1).

Regarding claim 1, Foxcroft discloses a method for receiving a multi-carrier signal, the method comprising the steps of:

defining an energy of pilot carriers (energy that exists in some or all of the unused carriers, page 5, lines 10-14) in said signal (received signal) in respect of an estimated guard interval position (can be placed within or outside the guard interval, page 4, lines 1-23, element 64, Fig. 6) of said signal (received signal, page 6, lines 11-14), and

based on said energy (when no additional energy in the unused carrier positions, page 4, lines 2-4), selecting a position for a time domain to frequency domain transform window (a correctly positioned FFT window location is made, page 4, lines 2-4) of said signal (of the received signal).

Regarding claim 2, Foxcroft discloses a method according to claim 1, wherein the step of defining comprises:

defining the energy of said pilot carriers in said signal in respect of the estimated guard interval position of said signal for predetermined amount of trial positions for said time domain to frequency domain transform window (for predetermined sample positions 72 and 74 for the FFT window position, page 6, lines 29-36), and

further the step of selecting further comprises:

selecting said position from said trial positions (determining the optimal position from positions of samples 72 and 74, page 7, lines 1-28).

Regarding claim 3, Foxcroft discloses a method according to claim 1, wherein the selection step comprises:

selecting said position for the time domain to the frequency domain transform window of said signal in such a way that the smallest amount of inter symbol interference is formed (selecting FFT window position such that the inter-symbol interference ISI is minimized, page 2, lines 10-16, page 5, lines 8-9).

Regarding claim 7, Foxcroft discloses a method according to claim 1, further comprising, before the step of defining, the step of:

performing a coarse timing for said signal for an initial position for said time domain to frequency domain transformation window (estimated window position is selected, page 6, lines 15-18).

Regarding claim 8, Foxcroft discloses a method according to claim 1, wherein the step of defining is performed according to a predetermined scheme for determining a predetermined amount of trial positions for said time domain to frequency domain transform window (according to the predetermined sample positions 72 and 74 for the FFT window position, page 6, lines 29-36), and based on said energy, selecting the time domain to frequency domain transformation window from said trial positions in such a way that the smallest amount of inter symbol interference is formed (selecting FFT window position from the sample positions such that the intersymbol interference ISI is minimized, page 2, lines 10-16, page 5, lines 8-9).



Regarding claim 9, Foxcroft discloses a method according to claim 1, further comprising the step of performing a fine timing with the selected time domain to frequency domain transformation window for fine tuning said selected time domain to frequency domain transformation window (the power measurement for the next offset FFT window position is then performed, page 7, lines 9-15).

Regarding claim 10, Foxcroft discloses a method according to claim 1, further comprising, before the step of defining, the steps of:

performing a first time interpolation for said signal (finding the FFT output for an advance in FFT window position of one sample, page 6, lines 32-33), further, before the step of selecting, taking a certain amount of trial positions for said time domain to frequency domain transformation window in accordance with a predefined scheme (taking predetermined samples 72 and 74 for the FFT window position, page 6, lines 29-36), and further,

based on said energy (when no additional energy in the unused carrier positions, page 4, lines 2-4), selecting the time domain to frequency domain transformation window position of said trial positions with the smallest amount of interference (selecting FFT window position such that the inter-symbol interference ISI is minimized, page 2, lines 10-16, page 5, lines 8-9), initializing a second time interpolation with the selected position (calculates successive advance in position in an iterative manner, sample by sample, page 6, lines 29-31), and

fine tuning said time domain to frequency domain transformation window (the power measurement for the next offset FFT window position is then performed, page 7, lines 9-15).

Regarding claim 11, Foxcroft discloses a method according to claim 10, wherein said first time interpolation comprises a linear time interpolation (successive advance in position in an iterative manner, page 6, lines 29-31).

Regarding claim 12, Foxcroft discloses a method according to claim 1, wherein said time domain to frequency domain transform window of said signal comprises FFT-window (FFT window, page 4, lines 1-23).

Regarding claim 14, Foxcroft discloses a method according to claim 1, wherein said pilot carriers are scattered pilot carriers (some or all of the unused carriers, page 5, lines 10-14).

Regarding claim 15, Foxcroft discloses data processing system comprising means for carrying out the method according to claim 1 (FFT processor, FFT side bin power measurement, select best window position block, elements 16, 20, 22, Fig. 1).

Regarding claim 20, Foxcroft discloses a receiver for receiving a multi-carrier signal, the receiver comprising:

means for defining an energy of pilot carriers (energy that exists in some or all of the unused carriers, page 5, lines 10-14) in said signal (received signal) in respect of an estimated guard interval position (can be placed within or outside the guard interval, page 4, lines 1-23, element 64, Fig. 6) of said signal (received signal, page 6, lines 11-14), and

based on said energy (when no additional energy in the unused carrier positions, page 4, lines 2-4), means for selecting a position for a time domain to frequency domain transform window (a correctly positioned FFT window location is made, page 4, lines 2-4) of said signal (of the received signal).

Regarding claim 21, Foxcroft discloses a receiver according to claim 20, wherein said means for defining comprises a fine timing unit (window position selection block 22, Fig. 1).

Regarding claim 22, Foxcroft discloses a receiver according to claim 20, wherein said means for selecting comprises a fallback unit for tracking predetermined trial positions for time domain to frequency domain transform window (FFT algorithm for tracking samples for FFT window positions, page 6, lines 27-31) and a control unit for selecting the position from said trial positions (select best window position block, element 22, Fig. 1).

Regarding claim 23, Foxcroft discloses a system for receiving a multi-carrier signal, the system comprising:

means for determining a predetermined amount of trial positions for FFT-window according to a predetermined scheme (according to the predetermined sample positions 72 and 74 for the FFT window position, page 6, lines 29-36),

means for defining an energy of pilot carriers (energy that exists in some or all of the unused carriers, page 5, lines 10-14) in said signal (received signal) in respect of an estimated guard interval position (can be placed within or outside the guard interval, page 4, lines 1-23, element 64, Fig. 6) of said signal (received signal, page 6, lines 11-14), and

means for selecting a position from said trial positions for said FFT-window in such a way that the smallest amount of interference is formed for a desired signal (selecting FFT window position such that the inter-symbol interference ISI is minimized, page 2, lines 10-16, page 5, lines 8-9).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Foxcroft in view of Xu et al. (US Publication 2003/0026257).

Regarding claim 13, Foxcroft discloses all the aspects of the method according to claim 1 above.

Foxcroft may not explicitly show said multi-carrier signal comprises a mobile IP over DVB-T signal.

However, Xu teaches a multi-bearer-type network such as DVB is used with mobile IP support (paragraphs 0046).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of selecting FFT window position in Foxcroft's DVB-T network with the teaching of Xu in having a multi-bearer-type network such as DVB to use mobile IP support such that said multi-carrier signal comprises a mobile IP over DVB-T signal.

The motivation to do so is to receive video clips using the high bandwidth provided by the DVB-T network.

8. Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foxcroft in view of Atungsiri et al. (US Publication 2003/0016773 A1).

Regarding claim 16, Foxcroft discloses all the aspects of claim 1 above, except fails to explicitly show a computer program comprising computer program code means adapted to perform the method of claim 1 when said program is run on a computer.

However, Atungsiri teaches a COFDM receiver that locates a FFT window position by adjusting the FFT window position in the order that the window position includes the maximum energy representative of the data bearing signal samples. Atungsiri also teaches that this method of the receiver is implemented by having a computer-readable medium encoded with computer executable instructions and computer program, when executed, will cause the computer to perform the method (paragraph 0036 and page 14, claims 16-19).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of selecting FFT window position in Foxcroft's DVB-T network with the teaching of Atungsiri such that the method of Foxcroft will be implemented by having a computer-readable medium encoded with computer instructions, when executed, will cause the computer to perform the method of selecting FFT window position.

The motivation to do so is to configure a computer to operate the functions of a COFDM receiver.

Regarding claim 17, Foxcroft and Atungsiri disclose all the aspects of claim 16 above. Foxcroft may not explicitly show a computer program as claimed in claim 16 embodied on a computer readable medium.

However, Atungsiri teaches a COFDM receiver that locates a FFT window position by adjusting the FFT window position in the order that the window position includes the maximum energy representative of the data bearing signal samples. Atungsiri also teaches that this method of the receiver is implemented by having a computer-readable medium encoded with computer executable instructions and computer program, when executed, will cause the computer to perform the method (paragraph 0036 and page 14, claims 16-19).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of selecting FFT window position in Foxcroft's DVB-T network with the teaching of Atungsiri such that the method of Foxcroft will be implemented by having a computer-readable medium encoded with computer program, when executed, will cause the computer to perform the method of selecting FFT window position.

The motivation to do so is to configure a computer to operate the functions of a COFDM receiver.

Regarding claim 18, Foxcroft discloses all the aspects of claim 1 above, except fails to explicitly show a computer readable medium comprising program code adapted to carry out the method of claim 1 when run on a computer.

However, Atungsiri teaches a COFDM receiver that locates a FFT window position by adjusting the FFT window position in the order that the window position includes the maximum energy representative of the data bearing signal samples. Atungsiri also teaches that this method of the receiver is implemented by having a computer-readable medium encoded with computer executable instructions and computer program, when executed, will cause the computer to perform the method (paragraph 0036 and page 14, claims 16-19).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of selecting FFT window position in Foxcroft's DVB-T network with the teaching of Atungsiri such that the method of Foxcroft will be implemented by having a computer-readable medium encoded with computer program, when executed, will cause the computer to perform the method of selecting FFT window position.

The motivation to do so is to configure a computer to operate the functions of a COFDM receiver.

Regarding claim 19, Foxcroft and Atungsiri disclose all the aspects of claim 16 above. Foxcroft may not explicitly show a carrier medium carrying the computer executable program of claim 16.

However, Atungsiri teaches a COFDM receiver that locates a FFT window position by adjusting the FFT window position in the order that the window position includes the maximum energy representative of the data bearing signal samples. Atungsiri also teaches that this method of the receiver is implemented by having a computer-readable medium encoded with computer



executable instructions and computer program, when executed, will cause the computer to perform the method (paragraph 0036 and page 14, claims 16-19).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of selecting FFT window position in Foxcroft's DVB-T network with the teaching of Atungsiri such that the method of Foxcroft will be implemented by having a computer-readable medium/carrier medium encoded with computer program, when executed, will cause the computer to perform the method of selecting FFT window position.

The motivation to do so is to configure a computer to operate the functions of a COFDM receiver.

***Allowable Subject Matter***

9. Claims 4-6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 24 is allowed.

The following is a statement of reasons for the indication of allowable subject matter:

In claim 4, a method according to claim 1, wherein said step of selecting is based on energy outside the estimated guard interval position having the minimum.

In claim 5, a method according to claims claim 1, wherein said step of selecting is based on energy inside the estimated guard interval position having the maximum.

In claim 6, a method according to claim 1, wherein said step of selecting is based on an energy ratio between energy sample inside the estimated guard interval position and energy sample outside the estimated guard interval position.

In claim 24, a method for receiving an OFDM radio signal, comprising the steps of:

(d) extracting scattered pilots from said first output to obtain a second output, (e) performing a linear time interpolation for said second output, (f) performing IFFT for the time interpolated scattered pilots for obtaining a channel impulse response (CIR), (g) estimating energy based on the CIR, (l) performing IFFT for the time interpolated scattered pilots, and (m) fine tuning the selected FFT-window in accordance with the IFFT.

***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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